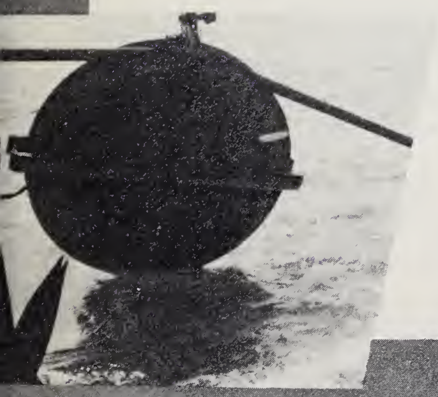
Rural Lines

November 1955

Electrification Section



Raising submarine cable.
See page 12.

RURAL ELECTRIFICATION ADMINISTRATION • U. S. DEPARTMENT OF AGRICULTURE

A Message from the ADMINISTRATOR

I recently had the pleasure of attending for the first time the annual National Safety and Job Training Conference sponsored by the instructors who work in your safety program. It was a great inspiration to me to see the enthusiasm of this group and to learn how successful their work is.

Safety, of course, is always a matter of concern to us. The personal tragedy of an accident perhaps has even greater impact in a small community than it does in a city. I am sure we all want our REA program to be recognized for its safety, and to know that the safety activity is getting results in the way of declining number of accidents, and particularly of fatalities. Any fatal accident is one too many, but the record is now far better than it was in the early days of rural electrification.

Another benefit of your safety program is what it means in money. Your rural electric system suffers a money loss every time an employee is injured or the smooth flow of work is interrupted by an accident. Also, in every state where a safety program has been in operation for an appreciable length of time, it has had a favorable effect on insurance rates. That means a saving for the co-op business and for the consumer.

Another point that struck me as I attended this nation-wide meeting was that I was seeing in action a group of men who were at home with responsibility and leadership. There was technical skill and there was sincerity, inspiration and the ability to bring out the best in other people.

Certainly the safety program is a shining example of an activity in which the electric co-ops have taken almost full responsibility. Success of this program of our borrowers is proof of the soundness of this policy and, within the framework of our responsibility, we want to do everything we can to help it go forward.

Ancher Nelsen

Administrator.

Issued monthly by the Rural Electrification Administration, U. S. Department of Agriculture, Washington 25, D. C. Subscribe to this publication from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price, $1.50 a year; foreign, $2 a year; single copies, 15 cents. Printing of this publication has been approved by the Director of the Bureau of the Budget, January 25, 1954 ● Vol. 2, No. 6.

How-To Is Keynote

Workshop Sessions Will Feature Power Use Meeting at St. Louis November 28-30

With power use promotion reaching the "how-to-do-it" stage almost everywhere in the country increasing attention is focusing on the second annual National Power Use Workshop at the Chase Hotel, St. Louis, November 28-30.

Sponsored by the Inter-Industry Farm Electric Utilization Council, the 3-day program—most extensive undertaking of its kind in the nation's history—will feature panel- and workshop-type sessions manned by experts in every field of electrification and agriculture.

Advance indications point to heavy attendance. In late September, 2 months ahead of the meeting, hotel reservations had topped the 400 mark set at the first Workshop, also held in St. Louis, last February. Registrations include representatives of rural electric cooperatives, power companies, manufacturers and distributors of electrical appliances, farm production equipment and water systems, electrical wiring contractors, agricultural leaders and Extension Service people.

The Workshop program incorporates many suggestions received from state inter-industry power use groups and is beamed at providing delegates with a maximum of helpful information for local use, according to Fred H. Strong, REA Deputy Administrator and chairman of the national Inter-Industry Council.

Three speakers will participate in the opening general session Monday afternoon, November 28, with Mr. Strong as chairman. They are:

Ancher Nelsen, Administrator of REA, who will review progress made in inter-industry power use promotion and discuss the future of rural electrification.

John P. Madgett, manager of Dairyland Power Cooperative, LaCrosse, Wis., who will talk about the relationship between load-building and the cost of power to the ultimate consumer, and the similarity of objectives of all segments of the electric power industry.

Edwin Vennard, president of Middle West Service Company, Chicago, a utility management consultant firm, whose address at the first Workshop attracted nationwide attention. Mr. Vennard's slide-illustrated talk will deal with the relationship of load building to load factor and net margin or profit, featuring new material on the special problems of REA-financed distribution systems.

The Workshop will also have 2 new features: showings of the newest and most effective power use motion pictures, Monday and Tuesday evenings, and 20 or more educational exhibits and displays of materials, devices, techniques and publications now being used to advance electric farming.

Sales activities will move into the spotlight Tuesday morning when participants will divide into 3 roundtable groups to take part in panel discussions of 3 impor-

tant areas of the power use program. The topics were rated as "most important" in answers to questionnaires sent to 1,000 rural electric cooperatives, 300 power companies and hundreds of manufacturers by the Inter-Industry Council. These roundtable groups will continue through the day. The discussion topics and roundtable chairmen are:

WATER — FARM PROFITMAKER. Chairman, Harry Oswald, Executive Manager, Arkansas State Electric Cooperative, Little Rock, Ark.

WIRING FOR TOMORROW'S NEED. Chairman, Merrill Skinner, Vice President, Union Electric Company, St. Louis, Mo.

EQUIPMENT SALES: KEY TO PROFITABLE OPERATIONS. Chairman, T. E. Craddock, Manager, B-K Electric Cooperative, Seymour, Texas.

Three new roundtable groups will get under way Wednesday morning. The discussion topics and chairmen are:

STATE COUNCILS GEARED FOR ACTION. Floyd I. Fairman, Vice-President, Kentucky Utilities Company, Lexington, Ky.

GOOD SERVICE SELLS POWER USE. Chairman, J. C. Cahill, Farm & Rural Service Coordinator, Detroit Edison Company, Detroit, Mich.

TRAINING MAKES SENSE AND DOLLARS. William T. Crisp, Manager, Tarheel Electric Membership Association, Raleigh, N. C.

Each chairman will have a panel of experts equipped to lead the discussions and to "field" the toughest questions that can be thrown from audience participants.

The final half-day of the Workshop will get under way after lunch Wednesday with a general session at which will be presented summary reports by each roundtable group. Delegates will be asked to help evaluate the Workshop and to help plan the third such national meeting.

Proceedings of each roundtable group and the general sessions will be recorded, transcribed, and distributed by mail without charge to all delegates and others interested immediately after the Workshop.

Registration will begin Sunday afternoon, November 27, at the Chase Hotel, and will continue through Monday morning.

Members of the national Inter-Industry Council are Oliver Kimbrough, manager of Farmers Electric Cooperative, Clovis, N. Mex.; William W. Lynch, president, Texas Power and Light Company, Dallas, Texas; R. W. McClure, vice president, Kansas Power and Light Company, Lawrence, Kans.; John P. Madgett, manager, Dairyland Power Cooperative, LaCrosse, Wis., James K. Smith, manager, Kentucky Rural Electric Cooperative Corporation, Louisville, Ky., and C. V. Sorenson, vice president and general manager, Indiana & Michigan Electric Company, Ft. Wayne, Ind. Mr. Strong, chairman, is a non-voting member.

John P. Madgett **Edwin Vennard**

AEC Invitation for Proposals on Small Plants Offers REA Borrowers

Atomic Opportunity

Rural electric systems interested in getting into the atomic energy field have an opportunity in the AEC's second call for proposals for development, design, construction and operation of power reactors.

The reactors to be considered by AEC in this invitation are limited to plants in 3 capacity ranges —5,000 to 10,000 kilowatt capacity, 10,000 to 20,000 kw, and 20,000 to 40,000 kw range. These would be suitable for use by the smaller utilities, such as rural electric cooperatives.

In a letter to borrowers transmitting copy of the AEC announcement, Administrator Ancher Nelsen pointed out that the submission of a proposal by an REA borrower in response to this invitation will require a coordinated effort by the borrower, its engineer, a manufacturing firm and REA. He offered REA's services to borrowers in the preparation of a proposal "if you plan to submit one."

Proposals will be accepted by AEC through February 1, 1956.

The AEC announcement outlines the procedure for preparing a proposal, indicates the financial and other types of AEC assistance which may be given the applicant and states the criteria to be used in deciding which proposals to accept. Proposals will be evaluated on a competitive basis in and between the different power ranges and within the limits of funds and materials available from AEC, as well as on the contribution to reactor development offered by the proposal.

Commenting on the announcement, Mr. Nelsen said:

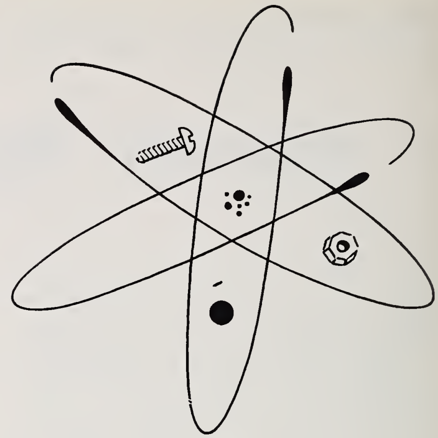
"It is hoped that the experience gained in building and operating the smaller experimental reactors in this phase of the AEC Power Demonstration Reactor Program will point the way to competitive-cost power from small reactors. It is thus another major step in the search for methods by which fissionable materials can be used to produce electric energy at lower costs than conventional fuels."

The AEC invitation is in part a follow up of a recommendation made on April 7, 1955, by Mr. Nelsen in a letter to Chairman Lewis L. Strauss of the AEC. At that time the REA Administrator urged consideration of proposals in the 5,000 to 20,000 kw range, in an effort to bring the smaller reactors into a competitive cost position.

The current invitation is the second issued under the AEC's Power Demonstration Reactor Program, which was established in January 1955 to open the way for broader nuclear development.

Nuts, Bolts and Neutrons

Atomic Energy Compared With Other Fuels, and Its Problems Analyzed



Just 50 years ago, in 1905, the late Professor Albert Einstein announced the theory of the interchangeability of matter and energy that is the foundation of nuclear power.

His concept was revolutionary, and it was not until 1939—34 years later—that laboratory technology progressed to the point that his theory could be verified by experiment. Those experiments were known as "atom smashing" and their results alerted scientists to the great potentialities of nuclear energy.

Although first efforts were devoted to destructive use of the atom, at the same time the possibility of utilizing this tremendous new force for peaceful ends was recognized. Near the end of 1942, at the University of Chicago, the first controlled, low power, nuclear reaction took place.

Since then substantial progress has been made in introducing the nuclear reactor into the electric power industry. But the power aspect of nuclear development is still young. Since effective use of nuclear reactors requires development of entirely new technologies, it is reasonable to expect that it will take a few years to obtain practical, economical solutions to the many challenging problems confronting the engineer.

The principle of nuclear fission is entirely different from the principle of combustion of fuels, which has been known and used in industry for centuries. The mechanism of nuclear fission is in the realm of the physicist. He is concerned with behavior of neutrons, and of other particles and radiations.

So let us leave the neutrons to the physicist and confine ourselves to the "nuts and bolts" or "hardware" aspects of nuclear reactors as applied to electric power generation.

The conventional coal-fired steam plant is made up of 2 major units. The steam generating unit consists of a fuel handling system, combustion equipment, boiler and an ash disposal system.

This is one of a series of basic articles prepared by REA personnel who are cleared for atomic energy work and are engaged in REA's liaison work with the Atomic Energy Commission. The series will deal with the nature of atomic energy and its use in producing electric power.

The electric generating unit consists of a turbine, generator, condenser, feed water system and cooling water system. We can disregard the turbine generator and its associated equipment as being the same in both power plants, and eliminate it from consideration.

Let us then compare the nuclear reactor with the conventional steam generating unit and look at some of the engineering problems.

The heart of the reactor is known as the core. It performs the same function as the fuel handling and combustion equipment in the conventional steam generator. The conventional steam generator takes coal in almost its natural state, and feeds it into the firebox of the boiler by means of a reasonably simple mechanical stoker. In the reactor core, however, heat is generated by nuclear fission within fuel rods or plates made of uranium.

A nuclear fuel element appears deceptively simple—it looks like a group of metal rods or tubes or plates. Yet this device poses some of the most challenging problems in the reactor business.

The first problem revolves around the nature of uranium. It does not occur free in nature. It must be obtained from other ores by a complicated refining process. When metallic uranium is finally produced it has many unattractive features affecting its use in reactors. One of its worst characteristics is that it corrodes readily. When employed as part of a fuel element it must be protected by a non-corrosive metal.

At the present time only 2 or 3 known metals are satisfactory for cladding. The one which has the best features for power reactors is the metal zirconium. Both uranium and zirconium have been used so little that the metallurgists don't know much about them. Consequently, a great deal of time and effort must be spent in finding out how these 2 materials may be handled—how they respond to rolling, machining, welding and other fabrication methods.

The heat developed by a reactor is generated inside the uranium metal. To avoid hot spots which might damage the fuel elements, the heat must be generated uniformly throughout the entire element. This means that the uranium must be uniform in quality and machined to close tolerances. Once the heat is generated, it must be removed from the uranium to be used. This requires a tight bond between the uranium and the cladding.

During operation of the reactor the uranium slowly changes into other chemical elements. After a period of months or years the fuel rods must be replaced. Burned out fuel elements must be handled by remotely controlled tools to protect plant personnel. They still contain a high percentage of usable uranium and the radioactive material must be removed from the fuel elements. This is an elaborate chemical process.

This brings us to another major problem of nuclear power—the disposal of "atomic ash." This might be compared with the ash disposal problem in a conventional steam plant. Furnace ash is not harmful and is thought of princi-

pally as a nuisance. But the situation is quite different in the case of radioactive fission products. Radioactive ash must be buried either on land or at sea. Efforts are being made to find other ways of disposing of it or, preferably, of developing some commercial use for it.

A third challenging problem of the nuclear reactor also is concerned with radioactivity. When the reactor is operating, the core gives off, in addition to useful heat, neutrons, various other particles and radiations. They affect practically everything they touch. Some of them are dangerous to human life.

Everything that comes in contact with the reactor core, and this includes the water or other coolant used to convey heat of the core to the heat exchanger or turbine, becomes radioactive.

This requires that the reactor core, the coolant, and all pipes, valves and other equipment through which the coolant flows, be surrounded by a shield, usually made of concrete, of sufficient thickness to absorb dangerous radiation. The system must be essentially leaktight. Means must be provided for containing any small amount of leakage that can be tolerated or may occur due to accidental rupture of plumbing.

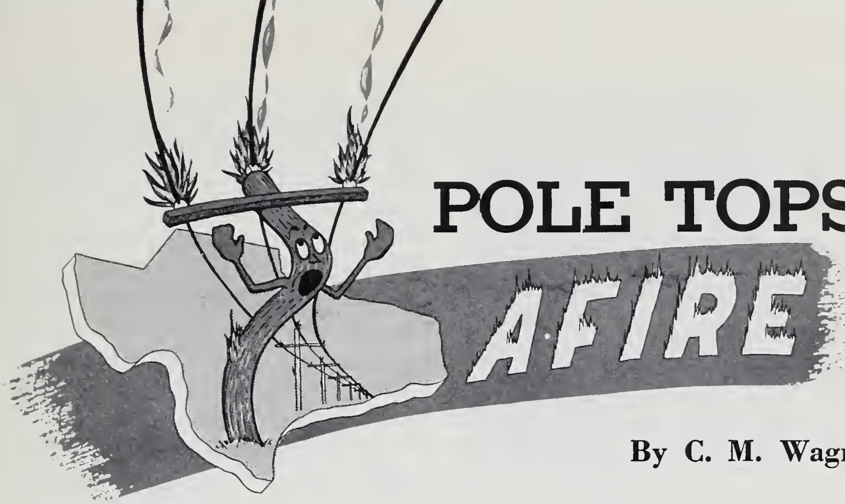
A fourth major problem relates to control of the operation of the reactor. Provision must be made for adjusting output of the reactor to meet the demand of its associated turbine generator, and to shut down the reactor completely in event of failure or trouble in any part of the reactor system. Control equipment has to be accurate, simple, reliable and "fail safe." That is, failure of the control system itself should shut down the reactor.

Operating standards for reactor control devices are more severe than for the controls used in conventional steam plants. Under "runaway" conditions the heat generated in the reactor core may be multiplied a million times in 1/10th of a second or less. Therefore the shutdown control must work fast and be reliable. This is known as the "scram" control.

After reviewing these broad classes of reactor problems a few questions naturally arise: Are the problems associated with nuclear power unsolvable? Are we beating our heads against a stone wall? Are we engaging in a lot of wishful thinking? Are we reaching for the moon? The answer to each of these is an emphatic NO.

We may expect that as experience is obtained in design, construction and operation of power reactors as parts of actual electric power systems, standardization and simplification of equipment will occur, mass production methods will be employed, and reactor costs will decrease.

When Einstein unlocked the secret of the atom, he opened the way for development of a great new source of energy. Technical problems of the type mentioned have to be overcome before the atom can economically be put to work generating electricity. It is good that we have pioneering work going forward. It will bring us that much closer to the day when atomic fuel will take its place with other sources of energy.



POLE TOPS AFIRE

By C. M. Wagner

If You Think Sleet Means Trouble, Imagine Having Your Poles Burn Up as Happens on This Texas Co-op

During the late spring and early summer we experienced a very large number of pole fires, sometimes as many as 29 poles on fire at one time.

For a period of almost 3 months the wind blew continuously out of the southeast and when it reached 20 to 30 miles an hour our trouble started. The area covered was about 60 miles square, but the spots of extreme contamination shifted from day to day and hour to hour.

Before going on with the story, however, I should explain what happens.

The lines of Nueces Electric Cooperative are located along the southern Texas Gulf coast. Salt, moisture and oil borne by the wind from Baffin Bay and Laguna Madre form deposits on our poles.

Then, under drought conditions with the wind blowing sand hard enough the deposits begin to heat up, due to power leakage. Temperatures get so high the poles burst into flame.

We had this trouble in 1951 and 1953. At first we reinsulated the lines with fog type insulators and removed the pole ground down to the neutral wire. This helped but during the 1953 drought the problem occurred again.

This year, 1955, we experienced a worse drought so that no vegetation grew at all and the sand blew as badly as in West Texas.

We had several nights when deposits on the side of the poles, insulators, and crossarms reached 1½ inches in thickness.

We changed out insulators and put up new, clean ones and in less than an hour the pole was burning. We had one oil circuit recloser that operated 26 times in 25 minutes.

One night for about an hour and a half the leakage was so bad

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C. M. Wagner is manager of Nueces Electric Cooperative, Inc., headquarters at Robstown, Texas. The co-op serves the coastal area near the southernmost tip of the United States.

our men could not climb some of the poles. They tried stepping onto the pole from the truck wearing rubber gloves, but their climbing tools were so hot on their feet and legs that they could not stay on the pole.

The contamination at one time this spring built up so much that deposits would fall from the conductors of their own weight and the vibration of the wire.

When our crews came in, the men would have deposits on their faces and clothing that made them look as if they had been in a turkish mud bath.

At Kingsville, the C. P. & L. 69-kv transmission lines of H frame construction using 6 suspension insulators in each string had flashovers from phase to phase. Their substations did not require flood lights for work at night.

This company used several pumper trucks each night to wash down substations with boiler water. Regular tap water would not do. The areas were so large they did not try to wash down transmission lines.

The company did take clearance on transmission lines to wash insulator strings by hand, only to have the same trouble the next night and sometimes even within an hour after cleaning them.

We had 50 plastic covers made by hand for the pole top insulators and 50 of the plastic covers for the suspension insulators. These covers completely covered the insulator around the top on the pole top insulators, but on the sides, bottom and pin we kept a clearance of 5/8 of an inch.

These covers were quite successful but another season will be required to determine if they can be depended upon to eliminate the trouble.

The Magic Valley and San Patricio Electric Cooperatives also experienced trouble but they did not have the drought we had nor the high winds. They had much more vegetation, too.

What do we have to look forward to?

If we do not get enough rain this winter and next spring for vegetation to grow, we will have the same trouble again.

This is one of the worst cases of pole top fires which has come to REA's attention. Other borrowers in Texas and Florida, where dust, sand, industrial contamination, and salt spray have led to this kind of trouble, have reported sporadic instances of pole top fires.

What about treatment? Suggestions include:

1. Reconsider choice of insulators.
2. Supplement structure design for maximum wood insulation by special handling near "shadow areas" on wood structures.
3. Ground pole line hardware.
4. Washing is a remedy in certain situations, but is not always feasible.
5. Consider use of new materials, including plastic covers such as those described by Mr. Wagner.

Pioneer

G. B. Linton, center, receives plaque from William A. Byers, right, president of the Board, as his successor, R. A. Edling, left, looks on.

One of the original organizers of the first REA-financed system in Colorado retired recently after serving 19 years on the board of directors without being absent from a single meeting.

That's the record of G. B. Linton, for 11 years vice president and president of the Grand Valley Rural Power Lines, Inc., Grand Junction, Colo.

Since the co-op was organized, it is estimated that the board has held around 266 meetings, and from the minutes it is clear that Mr. Linton attended every one. This includes one regular meeting every month and 2 or 3 special meetings a year. At the time of his retirement, Mr. Linton was the only original member still on the board.

Mr. Linton moved to the Grand Junction area in 1917 and bought a farm. His association with rural electrification officially began in June 1936. At that time he was selected by his neighbors as one of 9 directors to formally organize the Grand Valley Rural Power Lines, Inc. He was active in signing up its original membership to get enough people to make the project feasible.

In the 19 years Mr. Linton has served on the board, the co-op has grown from its original 638 members to 3,483 members. The system, which went into operation with 139 miles, today stretches over 702 miles.

In addition to serving as a director of the Grand Valley system, Mr. Linton has served also as secretary of the Colorado Ute Electric Association, which was organized to develop electric power sources on the Western Slope.

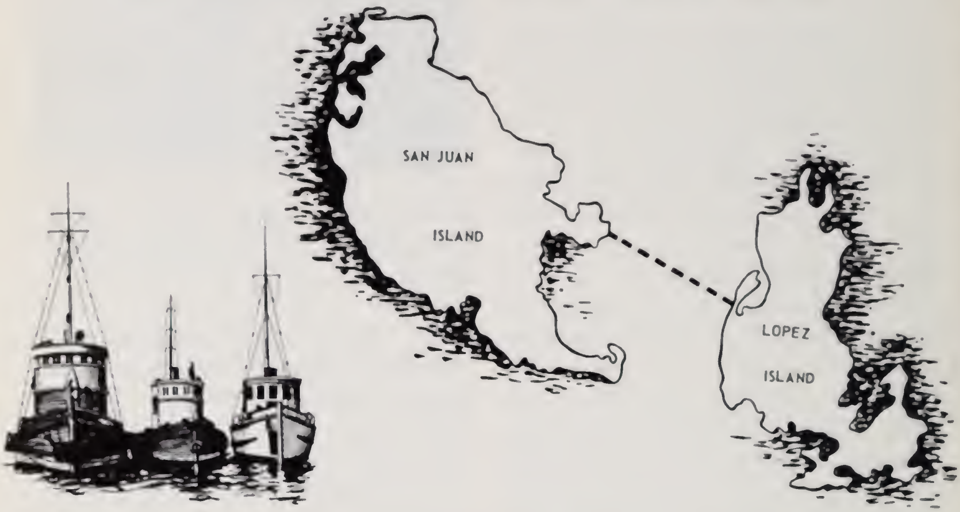
The Grand Valley co-op recently paid tribute to Mr. Linton with a dinner in his honor. At that time, William A. Byers, president of the board, presented Mr. Linton with a plaque in recognition of his long and faithful service to the co-op.

Mr. Linton's successor, R. A. Edling, is the son of one of the original board members.

The persons featured on this page have played key roles in bringing rural electric service to their own communities, thus helping their neighbors receive the benefits of electric power. This page also acknowledges the contributions of those many others who are nameless to us, but known to many of our readers. We salute all of our pioneers.

Washington System Battles High Winds and Strong Tides to Repair Cable

30 Fathoms Down



What happens when a submarine power cable breaks?

For one thing it sets in motion a big operation to get the break repaired and here, from a report by W. J. Hauck, REA field engineer, is a step-by-step picture of how the Orcas Power and Light Company of Eastsound, Wash., went about repairing its underwater line last spring.

The Orcas company, an REA borrower, laid the cable in 1952 bringing service to consumers on San Juan Island.

Three years later the strong tides had rubbed the cable against jagged underwater rocks until the cable covering had w
cable itself damaged.

When service failed at
preliminary tests reveal
nearly a mile off-shore.

Repair work could be
conditions were favorab
work and many delays
people worked on the
$36,000 including nearly
power for the San Juan

May 9 the cable was b
longer so as to avoid the

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ask

Ra
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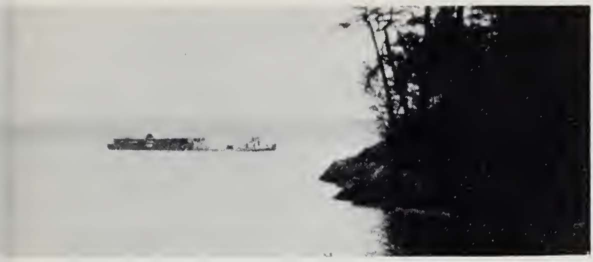
ble.

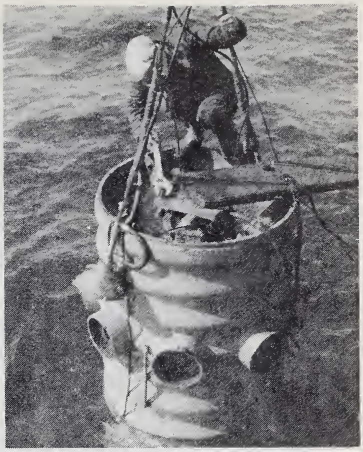
Here the first damaged section jams in the sheave. Thirty of the 41 steel armor wires were severed, although only 1 of the 3 conductors was exposed.

After pulling slack, this secon
feet beyond the first. A third
Strong tides had whipped the



pulls the barge to San Juan, Feb. 5, 1952, to lay the -foot cable. In April 1955 the question everyone had "If the cable fails, what then?" had to be answered.

was used to check depth. This one-time military landing t "floating junk yard", was used to underrun the ca- : was littered with equipment; every item was used.



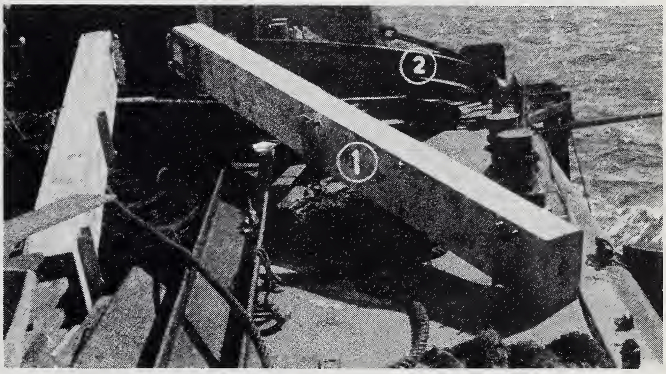
The 8,000-pound diving bell is brought up after Jim Dahl explored the underwater area. After his report, the barge was readied for underrunning. Sheaves were mounted fore and aft; an automatic brake was built. Large anchors (four 3,000-lb. and four 1,500-lb.), steel rope and another barge were obtained from Seattle.

out and parts of the

p.m., April 13, 1955, 3 points of damage

one only when tidal which meant night Altogether about 40 and costs ran over 4,000 for emergency nsumers.

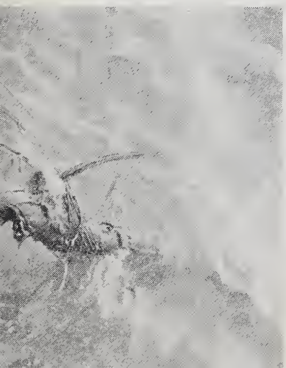
: in service—400 feet uble-causing rocks.



Barge equipment included cable stops (1) and sheaves (2). The stops, 12 feet long, were made of Alaska white cedar. The sheaves, 6 feet in diameter, were used to underrun cable.

ult was exposed about 85 k was found close to this. ble against channel rocks.

Vulcanizing the splice, shown here, took 24 hours. With new cable spliced in, the job was over—except for lowering line back to channel floor on the safe side of the rocks.



Loans To Improve Service

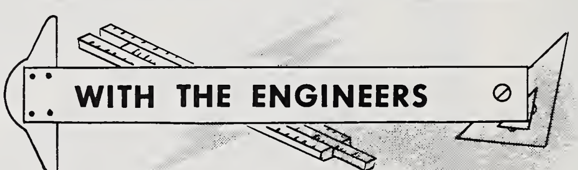
Better electric service for thousands of rural power users is on the way as the result of system improvements loans made by REA in the fiscal year ended June 30, 1955.

During the year REA made loans amounting to $36 million to 239 REA-financed power systems. More than 700,000 farmers and other rural consumers in 41 states and Alaska will benefit from the 1955 loans. In all of these cases, system improvements were made necessary by the increased demand of consumers for power.

These loans include funds to construct and improve substation facilities, heavy up lines, and increase the capacity of transformers, service drops and meters.

Here are the 1955 system improvements loans by states:

Alabama	**$ 781,040**	**Maine**	**$ 62,350**	**Oklahoma**	**$ 566,083**
Arkansas	**2,117,728**	**Maryland**	**405,740**	**Oregon**	**110,734**
California	**620,000**	**Michigan**	**260,700**	**Pennsylvania**	**1,135,986**
Colorado	**881,728**	**Minnesota**	**1,705,353**	**South Carolina**	**758,490**
Delaware	**75,000**	**Mississippi**	**1,225,471**	**South Dakota**	**319,995**
Florida	**652,421**	**Missouri**	**2,578,458**	**Tennessee**	**1,773,180**
Georgia	**2,549,878**	**Montana**	**551,001**	**Texas**	**3,121,794**
Idaho	**62,800**	**Nebraska**	**46,607**	**Vermont**	**5,000**
Illinois	**1,969,265**	**New Jersey**	**61,570**	**Virginia**	**1,203,689**
Indiana	**1,142,802**	**New Mexico**	**242,000**	**Washington**	**582,680**
Iowa	**1,257,273**	**New York**	**44,014**	**West Virginia**	**42,049**
Kansas	**1,994,571**	**North Carolina**	**673,295**	**Wisconsin**	**437,377**
Kentucky	**1,133,380**	**North Dakota**	**411,100**	**Wyoming**	**192,898**
Louisiana	**1,608,770**	**Ohio**	**632,799**	**Alaska**	**40,200**



Hot line tools best serve in the warehouse unless the crew is continually trained in their use.

. . . . .

Accidents caused by pole failures on electric systems are on the increase. How is your pole maintenance?

. . . . .

A system engineering study is more than a source of data for the next loan application. It is a long range plan for development of the system.

. . . . .

Two-way radio is being used experimentally to remotely control circuit breakers and power factor capacitors.

. . . . .

Line regulators are a valuable engineering-management tool.

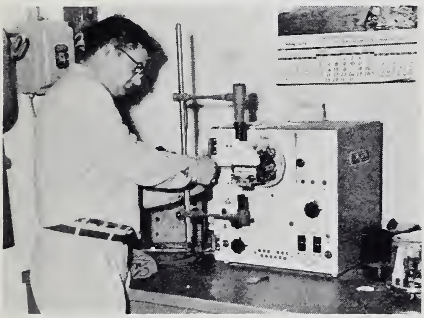
THE LINEMAN

Meter Repair Saves Money

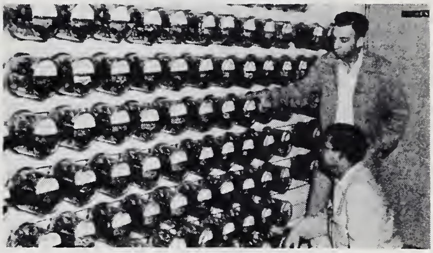
Lighthouse Electric Cooperative, Inc. of Floydada, Tex., reports that it saves an average of $700 a year by doing its own meter repair work.

And this good saving in meter repairs is only one of the advantages REA borrowers stand to gain, according to Manager Melvin Henry.

"We spent $1,632 for meter repair equipment a year or so ago and it has really paid off," says Mr. Henry. "We saved $350 over our meter repairman's salary the first 6 months. So far we've repaired well over 600 meters.



Wayne Collins, repairman, tests meter.



Mr. Collins, kneeling, and Manager Henry, right, look over meters in repair room.

"Besides saving our co-op money, our shop meter work saves us time in getting meters back into service. Our repairman does a complete job of calibrating, checking and repairing meters. We think there is a real advantage in knowing the history of all meters and repairs made."

Ira Maulding, line foreman of the Socorro Electric Cooperative, Socorro, N. Mex., recently paid thanks to a skunk for helping save a life.

A ditching machine cleaning out an irrigation ditch knocked down a co-op pole and left a single phase line stretched across the field. A farm woman and her children working in the field with a tractor stopped to raise the wire and suddenly desisted when they saw a skunk. They phoned the line crew and the damage was repaired.

The skunk? Thoroughly fried.

ELECTRIFICATION LOANS APPROVED AUGUST 9

THROUGH SEPTEMBER 23, 1955

$ 189,000 Guernsey-Muskingum Electric Co-op, New Concord, Ohio
300,000 Freeborn-Mower Cooperative Light and Power Association, Albert Lea, Minn.
260,000 Morrow Electric Cooperative, Mount Gilead, Ohio
285,000 Lower Colorado River Electric Co-op, San Marcos, Texas
110,000 Lumbee River EMC, Red Springs, N. C.
50,000 Carroll Electric Co-op, Berryville, Ark.
100,000 Suwannee Valley Electric Co-op, Live Oak, Fla.
1,750,000 Moon Lake Electric Association, Altamont, Utah
50,000 Grand Electric Co-op, Bison, S. Dak.
103,000 Charles Mix Electric Association, Lake Andes, S. Dak.
100,000 Choctaw Electric Cooperative, Hugo, Okla.
249,000 Petit Jean Electric Co-op, Clinton, Ark.
654,000 Otero County Electric Cooperative, Cloudcroft, N. Mex.
535,000 Medina Electric Cooperative, Hondo, Texas
132,000 Washington-St. Tammany Electric Co-op, Franklinton, La.
625,000 Columbia Basin Electric Co-op, Heppner, Ore.
400,000 Hickman-Fulton Counties Rural Electric Cooperative Corp., Hickman, Ky.
245,000 Miami-Cass County REMC, Peru, Ind.
685,000 Southern Pine Electric Power Assn., Taylorsville, Miss.
300,000 Lake Region Electric Association, Webster, S. Dak.
192,000 Mid-Yellowstone Electric Co-op, Hysham, Mont.
430,000 Norris Electric Cooperative, Newton, Ill.

$ 100,000 North Arkansas Electric Co-op, Salem, Ark.
100,000 Petit Jean Electric Cooperative, Clinton, Ark.
410,000 Choctawhatchee Electric Co-op, DeFuniak Springs, Fla.
740,000 Southeastern Illinois Electric Co-op, Eldorado, Ill.
240,000 Gulf Coast Electric Cooperative, Wewahitchka, Fla.
50,000 Arkansas Valley Electric Co-op, Ozark, Ark.
1,362,000 Laclede Electric Cooperative, Lebanon, Mo.
100,000 Clearwater-Polk Electric Co-op, Bagley, Minn.
11,173,000 Central Iowa Power Cooperative, Cedar Rapids, Iowa
833,000 Verdigris Valley Electric Co-op, Collinsville, Okla.
50,000 Marlboro Electric Cooperative, Bennettsville, S. C.
340,000 Dawson County Public Power District, Lexington, Neb.
367,000 Farmers Electric Cooperative, Clovis, N. Mex.
50,000 Buckeye Rural Electric Co-op, Gallipolis, Ohio
146,000 Mohave Electric Cooperative, Kingman, Ariz.
50,000 Wake Electric Membership Corp., Wake Forest, N. C.
250,000 Co-op Electric Company, St. Ansgar, Iowa
250,000 Tri-County Rural Electric Co-op, Mansfield, Pa.
175,000 Carbon Power and Light, Inc., Saratoga, Wyo.
261,000 Jackson Electric Cooperative, Black River Falls, Wis.
118,000 Calhoun County Electric Co-op, Rockwell City, Iowa
940,000 Mountain View Electric Assn., Limon, Colo.

REA STAFF CHANGES

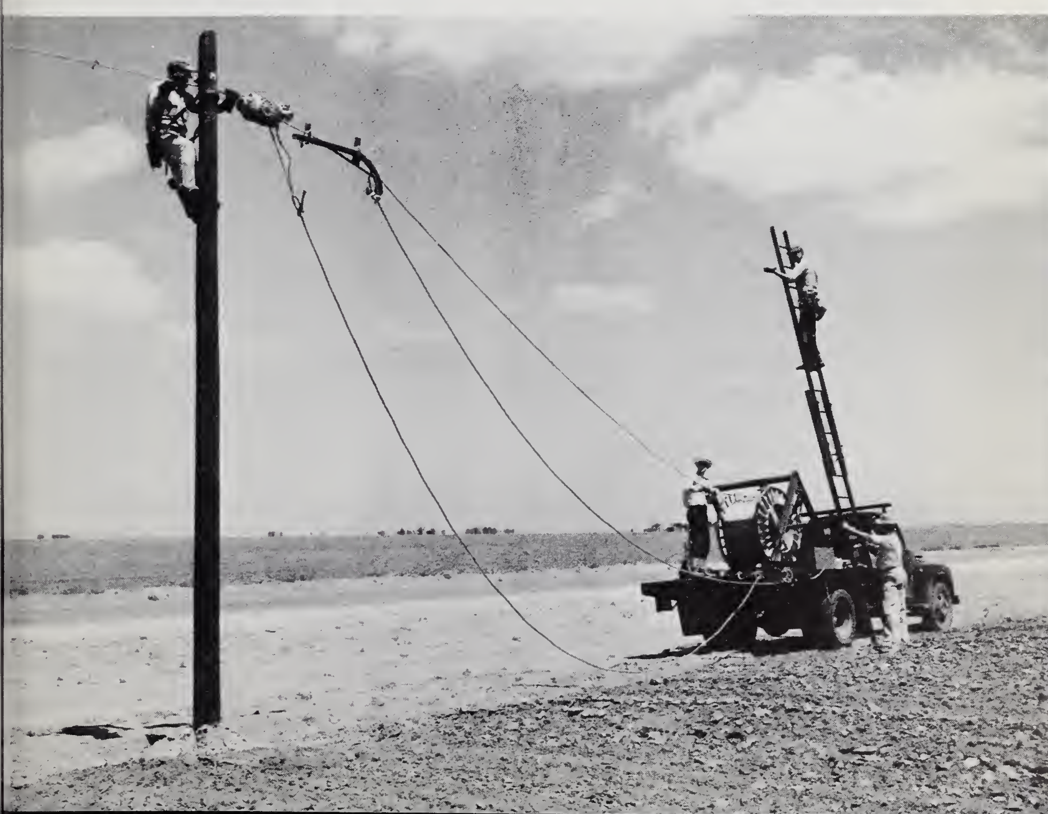
Wade Edmunds, formerly chief of the Northern Region of REA, has been assigned to a new post, that of Special Assistant for Nuclear Power Projects. He will be in the Office of the Assistant Administrator (Electric) Roy G. Zook and will direct and coordinate REA activities concerned with adapting nuclear energy to electric power production.

William Callaway, formerly chief of the Southern Region, has been appointed Director of Program Operations and will assist Mr. Zook in the direction and coordination of the activities of the 5 area offices.

Some reassignments of area directors have been made. William H. Eastman, an electrical engineer, returns from the telephone to the electric program as Director of the Southeast area. Director John H. Scoltock moves from Southeast to North Central, and O. W. Briden from North Central to Northeast, succeeding Ralph J. Foreman, who is now special assistant for power supply on the electric staff. Western and Southwest area directorships remain unchanged. The grouping of the area offices into Northern and Southern Regions has been discontinued.

Rural Lines

Telephone Section



Here Is a Do-It-Yourself
Project for Telephone Borrowers

Selling Rural Service

TO earn a share of the farmer's dollar, telephone service must compete with scores of other goods and services.

Of course, the telephone has a big advantage because there are few goods and services available to rural areas that are more valuable than adequate telephone service. It is both a convenience and an essential farm tool that saves money and time.

Merely making telephone service available, however, is not enough. Some people will use it at once, but many potential subscribers, before taking service, will need to be convinced of the value of dependable telephone service. And even those who are most anxious for service will lack information as to the full range of telephone services that are available to them.

So, even in a telephone-conscious community, there is plenty of selling for the telephone company to do. This helps the farmer and businessman get full use of a valuable service and it also assures the telephone company of maximum revenue from existing plant. With the narrow margins that exist in rural telephony, this is mighty important.

WHAT to Sell

Rural telephone companies should first concentrate on selling local service to attain maximum linefill and place idle plant in a paying status. Idle plant costs almost as much to operate and maintain as plant in service.

Every farmer should be told the advantage of extension telephones. More than 12 percent of city homes have extension telephones. Farm wives can be sold extension telephones for the upstairs as well as for outside. Sell the idea of colored extension telephones for the farm wife or daughter as a Mother's Day, birthday or Christmas present.

The telephone industry has many useful products — retractible cords, outdoor bells, voice amplifiers for hard-of-hearing persons, plug-in telephones, outdoor telephone booths, etc.

Take advantage of every opportunity to encourage long-distance calling. This is one of the best ways of increasing company revenues. Sell subscribers long distance credit cards. They enable your company to earn commissions on traffic originating outside your system. Become familiar with the various possibilities of working with your connecting companies in developing the use of toll service.

HOW to Sell

In selling service, nothing has yet been found as effective as

farm-to-farm canvassing. Visit your neighbor, get to know him, and sell him what he needs.

Treat each case individually and set up routine procedures to find what cases of poor service are due to the fact that the user is subscribing to a kind of service not adequate for his needs. Initiate systematic reporting of these cases on prospect slips to be worked at the earliest opportunity. Interview prospects personally.

Train employees to know your organization and let each one be a salesman. Provide all with service application blanks, prospect memorandum slips, and comprehensive information on what they have to sell so that they always have it at hand. Stimulate competition by keeping records of individual accomplishment. State this accomplishment in terms of dollars of additional revenue for each sale. Set a goal for increasing revenues and then exceed it.

***WHO* Will Buy?**

Farmers, their wives, and rural establishments such as stores, filling stations, etc., are potential buyers.

Farmers value their time and are quick to recognize the time-saving efficiency of dependable telephone service. Farmers' wives welcome the additional freedom obtained through modern telephone service.

Have you thought of selling special telephones for persons with impaired hearing who live on farms? More than 20 percent of our population has impaired hearing. You are in the communications business. Your farm and business constituents look upon you as experts in that line and expect from you professional performance and attention to their needs.

Don't forget the business firms serving rural areas. Electric companies, pipeline companies, and other rural establishments are busy with their primary functions. They want to leave their communications problems to the telephone specialist. That is you! Don't disappoint them. Study their communications needs and fill them.

Every rural area contains a business and social center around which a community of interest exists. Schools, churches, local government, doctors and all types of businesses serving rural areas represent the "other end" of farmers' telephone calls. They also represent an important market for extra telephone services. In addition to required high-grade service for local calls, business houses are constantly increasing their use of automatic answering services, PABX installations, and inter-office communication systems, all of which are good revenue producers. Encourage the local florist to order flowers by telephone.

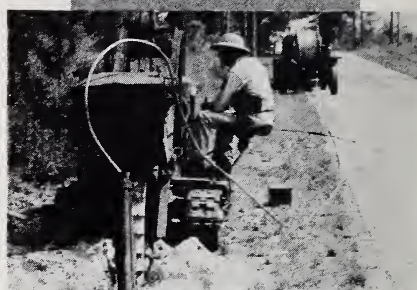
In every respect the rural telephone company or cooperative has a big sales job to do. Selling high quality telephone service is not difficult, but it requires attention to the desires and needs of each individual subscriber.

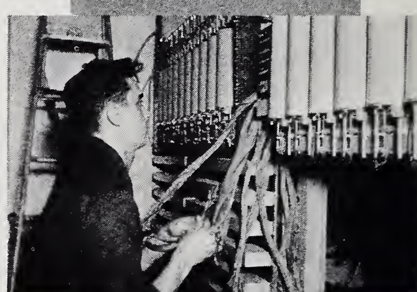
***WHEN* To Sell Service.**

Every telephone employee should be a salesman all the time.

COSTS ARE DOWN

Standardization and Competition Help Get Lower Bids





Substantial progress has been made in the past 2 years in cutting costs of rural telephone facilities financed by REA.

In a study of unit prices actually bid from July 1, 1953, to June 30, 1955, REA engineers found a decrease of 4.5 percent in overhead wire construction costs and a drop of 3.9 percent in the cost of cable construction over the 2-year period.

Savings on the purchase and installation of central office equipment were more pronounced, averaging 22 percent. This ranged from 18 percent on switchboards of a size not commonly used by rural telephone companies to 30 percent on the sizes more commonly used.

REA engineers attributed the reductions to more competition among contractors and suppliers, standardization of equipment used in REA-financed systems and a better understanding by contractors of REA procedure and requirements.

"This cost reduction is good news for farm families," Administrator Ancher Nelsen said. "It means that more farm families can get modern service at moderate cost."

"Earnings of rural telephone companies are modest in most instances, and the telephone company or cooperative has to depend for revenue largely on the direct

billing of subscribers for local service. Reduction in the cost of constructing and operating the system, coupled with favorable financing, offers about the only possibility of establishing and maintaining reasonable rates while giving the rural people telephone service of the most modern type and quality," Mr. Nelsen said.

Investment per Subscriber Reduced from 1953

Another REA study shows a 14 percent decrease since 1953 in the amount loaned and in the plant investment per subscriber. The following table summarizes this report.

	10/1/53 to 12/31/53	4/1/55 to 6/30/55	Percent Decrease
Number of Loans	41	49	—
Amount Loaned per Subscriber	$543	$457	15.8
Amount Loaned per Station	$527	$431	18.2
Plant Investment per Subscriber	$568	$487	14.3
Plant Investment per Station	$552	$459	16.8

Time Saved on Completion of Office Equipment

A further gain resulting from standardization of specifications and contract forms and use of competitive bidding has been in time saved. At present, the average completion time on dial central office equipment is about 240 days from the date of the contract as compared with 400 days during the early years of the program.

Specifications, prepared by REA in cooperation with the equipment manufacturers, describe the required performance and quantity of equipment but do not specify how the performance is to be achieved. Thus, equipment of the designs and types supplied by all of the 6 manufacturers can comply with the specifications. Standardization reduces the engineering required on the part of the manufacturers, and the delivery time can be shortened and total production costs reduced.

The Heins Telephone Company, Sanford, N. C., recently completed its 5,000th installation in the home of M. P. Myers, center, Lemon Springs. Dwight Cole, left, installer, and W. W. Lawrence, right, outside plant foreman, made the connection.

Lost: A Central Office

Operator Stuck to Her Post Until Raging Flood Swept Away Switchboard

Rural folks of flood-ravaged Pike County, Pa. are almost through with their "mopping up" operations but they are still talking about the courage of a veteran night telephone operator who stuck to her post until minutes before the raging waters washed away her home.

Mrs. Edwin Magnussen's home housed the central office exchange of the Lackawaxen and Hawley Telephone Company. She was the chief operator for the company serving the teeming resort communities of Lackawaxen, Rowland and Greeley. She left her switchboard only a few minutes before the building slipped into the Lackawaxen River — Indian for "swift waters."

The Lackawaxen and Hawley company is among REA's newest group of telephone borrowers, with a $159,000 loan contingent upon approval of the construction plans by the Pennsylvania Public Utility Commission. The funds will be used to convert the system to automatic dial service and to extend lines to some 300 additional subscribers.

But, it was "business as usual" in Lackawaxen, Greeley and Rowland on Thursday, August 19. Resort and summer camp owners were busy catering to tourists and vacationers who had come from many states to enjoy the cool air of the Pocono Mountains.

No one paid much heed to the storm and flood warnings broadcast at intervals during the day. Old timers said there hadn't been a serious flood in the area since Horace Greeley vacationed there, and that was a long time ago. Even when Hurricane Connie soaked the green hillsides with a 5-inch downpour, things looked safe enough.

But by evening, when Mrs. Magnussen went on duty, things began to change. Another torrential rain cut loose. The Lackawaxen, fed by a hundred streams and Lake Wallenpaupack, was soon at flood stage. The peaceful resort was hit by its biggest flood.

With the river swirling around her home, Mrs. Magnussen worked on to relay calls from frantic parents and friends.

"I knew folks were worried about their loved ones," she says simply. "I wanted to help all I could."

Not until her home began to teeter and roll on the river bank did she lay her head phones aside and move with her children to higher ground. They got out just in time—for soon the waters, which were swirling about the house, cut away the bank, and house and exchange went into the river.

No trace has been found of the

switchboard or other telephone equipment. It is believed that it was swept down the Delaware River.

Along with Mrs. Magnussen, Pike County's people are praising Dick Holversen, the company's alert maintenance man who worked night and day to put the crippled system back in order.

With its central exchange gone, several miles of pole and line down and communication cut off to nearby Scranton and other cities, the area might have been in real trouble if quick aid hadn't come.

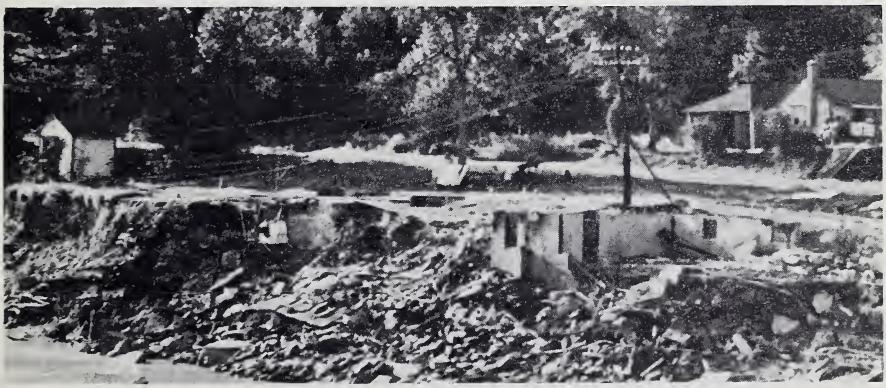
Lane Hart, Harrisburg, Pa., supervisor for Bell Telephone, called E. Y. Stroud, president of Lackawaxen and Hawley Telephone Company, at Dingman's Ferry, Pa., and Donald O. Neumeister of the company's consulting engineering firm at Scranton, and offered immediate use of a new magneto-operated switchboard.

Mr. Stroud tried to reach Dick Holverson at Rowland. All lines were down, and with bridges and roads leading to the village washed out, Mr. Holversen was isolated. The only contact with Rowland for several days was by Army helicopter which air-lifted food and medical supplies.

However, Mr. Holversen was not idle while he was waiting for the new switchboard. With help from Bell telephone linemen, he set up pay stations at Rowland and the Forest Lake Club (for emergency calls only), connecting to Bell's toll trunk circuit to Honesdale. Bell's toll operators handled emergency calls from the company's subscribers.

Within a week, Mr. Holversen had the new switchboard operating in George Rowland's general store in Rowland, and service restored to half of the subscribers. It took a bit of doing and many detours of 50 miles or more to connect the rest of the subscribers, but Holversen got the job done by mid-September.

Today, the folks are looking forward to the new dial system which Mr. Stroud says is soon to be installed through REA financing. To the 128 existing subscribers will be added 298 new subscribers when dial service is cut over.



After the flood—looking across Lackawaxen River to point at extreme left where telephone exchange stood before high waters swept it away.

UNITED STATES
GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON 25, D. C.

OFFICIAL BUSINESS

TELEPHONE LOANS APPROVED AUGUST 9 THROUGH SEPTEMBER 23, 1955

$ 165,000	Texas Farmers Telephone Co., Little River, Texas
339,000	Adams Telephone Cooperative, Camp Point, Ill.
68,000	Penfield Telephone Company, Luthersburg, Pa.
229,000	Solon Springs Telephone Co., Solon Springs, Wis.
344,000	Northwest Florida Telephone Co., Macclenny, Fla.
365,000	Triangle Telephone Association, Havre, Mont.
330,000	North Central Telephone Co-op, Lafayette, Tenn.
191,000	Santa Rosa Telephone Cooperative, Vernon, Texas
486,000	Delton Telephone Company, Delton, Michigan
270,000	Golden City Telephone Company, Golden City, Mo.
285,000	The Eagle Valley Telephone Co., Eagle, Colo.
118,000	The Eureka Telephone Company, Corydon, Ind.
327,000	Ardmore Telephone Company, Ardmore, Tenn.
1,560,000	Commerce Telephone Company, Commerce, Ga.
287,000	Farmers Mutual Cooperative Telephone, Harlan, Iowa
139,000	Union Telephone Company, Union, Maine
536,000	Clay County Rural Telephone Co-op, Poland, Ind.
$ 488,000	West Tennessee Telephone Company, Bradford, Tenn.
787,000	Dakota Cooperative Telephone Co., Irene, S. Dak.
325,000	Burnet Telephone Company, Burnet, Texas
580,000	Hill Country Telephone Cooperative, Ingram, Texas
391,000	Colorado Valley Telephone Co-op, La Grange, Texas
596,000	East Ascension Telephone Company, Gonzales, La.
227,000	Chariton Valley Telephone Corp., Bucklin, Mo.
106,000	Haxtun Telephone Company, Haxtun, Colo.
474,000	Texas County Rural Telephone Corp., Houston, Mo.
389,000	Green Hills Telephone Corp., Breckenridge, Mo.
159,000	Clear Valley Telephone Company, Clearwater, Minn.
163,000	Southwest Oklahoma Telephone Co., Duke, Okla.
1,007,000	Tri-County Telephone Company, Bonifay, Fla.
672,000	Sanborn Telephone Company, Sanborn, N. Y.
291,000	Wikstrom Telephone Company, Karlstad, Minn.
45,000	Tri-County Telephone Association, Inc., Basin, Wyo.